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Patent Application

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"Reflector of Synthetic Material for Traffic Signs or the like"

The present invention refers to a reflector of synthetic material for traffic signs or [a] like application.

Known as reflectors are plates of glass which have on their front side facing the traffic retroreflector elements (triples or the like) formed with optical accuracy and where the smooth backside is provided with a reflecting layer in the form of a silver coating. Reflectors of this kind have the disadvantage that they may only be made in relatively small sizes, because the glass plates with the retroreflector elements are cast and pressed into molds. A further considerable disadvantage is that the metal coating of the backside in the form of a vapor-deposited silver coating is of poor long-term durability, which usually does not exceed two years. Provided the silver layer is not sealed hermetically from the atmosphere, then chemical influences cause an even earlier loss of usefulness. Moreover, the previously described reflectors of glass are easily breakable.

In order to eliminate this shortage, it has already been proposed to use [a plate] of transparent synthetic material instead of a glass plate. Hereby, the front side facing the traffic is then smooth, whereas the retroreflective elements formed with optical precision are arranged on the backside. These are then either also covered with a vapor-deposited silver layer or else a covering takes place with a white synthetic material plate which is located at a small distance behind the retroreflector elements formed with optical precision. This covering synthetic material plate is hermetically fused to the synthetic material plate which carries the retroreflector elements. With these reflectors of synthetic material, the applied silver coating is also of poor durability and has the same disadvantages as the silver coating of the previously described glass plate. The procedure of covering the retroreflector elements formed with optical precision with a white plate of synthetic material and of airtightly fusing this cover with the plate requires a high technical

expense and also allows only for reflectors of a comparatively small size, in particular since according to the injection molding process, the synthetic material plate with the retroreflector elements is produced in one mold. Therefore, differently dimensioned reflectors require accordingly different and expensive injection molds.

The present invention has the object of eliminating the disadvantages of current reflectors of synthetic materials for traffic signs or such applications. To attain this object for a reflector of synthetic material, which has optically precise formed retroreflector elements (triples or the like) which are covered with a metal layer serving as reflective surface, it is proposed according to the invention that the retroreflector elements formed with optical precision be covered with a chromium or nickel layer and that this chromium or nickel layer be covered by an adjacent transparent and possibly colored layer of synthetic material.

The synthetic material in the form of a plate or such wall, which is provided with the retroreflector elements formed with optical precision may consist of such synthetic materials onto which a layer of chromium or nickel can be applied. According to a further characteristic according to the invention [it is] particularly advantageous to use a synthetic material on the basis of acrylonitrile-butadiene-styrene for this synthetic material plate or such wall, because this synthetic material can be provided very easily with a chromium or nickel layer, preferably by interleaving an intermediate copper layer or a copper coating.

The front side cover of the retroreflector elements formed with optical precision and the chromium or nickel layer covering it, with the transparent, possibly colored synthetic material layer may have a constant thickness such that the surface is uneven in agreement with the contour of the retroreflector elements. But according to a further characteristic according to the invention, the covering transparent or strongly translucent layer synthetic material is particularly advantageously smooth on the outside.

The reflector according to the invention can be used in the most varied applications. It may be attached, for example, on a reflector post, may be part of any other traffic sign and traffic control arrangements. It is also usable as [a] large surface and finally, an entire traffic sign may be reflective through the means for the object according to the invention.

The means for the object according to the invention may also be used as retroreflector on motor vehicles or other air- and water-craft.

According to a further characteristic according to the invention, the reflector is provided for the manufacture of foldable or collapsible emergency reflective triangles. The possibility for the most varied application results from [the fact] that, in addition to other advantages still to be described, the reflector may be cut to any size from a large reflector plate since this measure is possible with reflectors of the solution according to the invention. The reflector may also find use as [a] blow-formed body starting out from an inflated heated tube of synthetic material.

Being of synthetic material, the reflector according to the invention has in particular a high impact strength. The reflector layer in the form of a chromium or nickel layer is also of high strength and high resistance, in particular against influences from the atmosphere or the like, especially since it is covered entirely by the neighboring transparent synthetic material. At the same time, the chromium or nickel layer, which is embedded entirely in synthetic material, reinforces the reflector such that the strength of the reflector is increased. Furthermore, as a consequence of the possible and comparably simple measure of applying [it] in any adjustable layer thickness, the chromium or nickel layer as reflective surface is not only of high strength, but also has a high reflectivity.

The invention is represented exemplarily in the drawing.

Fig. 1 a section through a reflector plate according to the invention,

Fig. 2 an emergency reflective triangle with reflectors according to the invention.

The reflector 10 according to Fig. 1 consists of a synthetic material plate or such wall or molded part 11. On the side which when mounted or during the utilization of the reflector faces the traffic, this part 11 is provided with a plurality of retroreflector elements formed with optical accuracy, for example, in the form of a plurality of triangular pyramids or triples or the like lying next to one another. The part 11 with these previously mentioned retroreflector elements of a synthetic material which must not be transparent, can be produced in different ways. It may thus be an injection-molded part. In order to produce in particular large plates 11 which are later separated into individual small plates, for example

by sawing, it is also possible to produce the retroreflector elements 12 on the plate 11 or such mold in such way that the plate 11 is molded in an appropriate mold. It is also possible to produce these retroreflector elements through a calibration of a suitably thick foil or plate of synthetic material. The shaping of the retroreflector elements may further take place in that a warm synthetic material plate is pressed into a mold which is provided with the pattern of the retroreflector elements. Furthermore, an appropriate stamp provided with the pattern of the retroreflector elements or such impression die may be impressed on a heated synthetic material plate. Finally also, a heated tube of synthetic material may be blown into a blowing mold, the inner wall of which is provided with an appropriate pattern for the retroreflector elements, in order to render retroreflective an entire traffic sign formed as a blown body. The reflector according to the invention allows for many possibilities for the manufacture of the plate 11 with the retroreflectors 12, such that also large dimensioned plates 11 with allocated retroreflector elements 12 can be produced.

The retroreflector elements 12 are provided with a chromium or nickel layer 13, whereby an intermediate copper layer may be present to increase the adhesion of the chromium or nickel layer to the synthetic material plate 11 or the retroreflector element 12 present as one piece with [the plate]. This intermediate copper layer or the incorporation of copper particles into or in the vicinity of the surface of the retroreflector elements is advantageously present, provided the chromium or nickel layer is applied by electrolytic means and in addition hereto the plate 12 with the retroreflector elements 11 is electrically conductive.

The chromium or nickel layer 13 provides a mirror surface which is facing away from the retroreflector elements 12 and the plate 11. With current reflectors which have a coating of the retroreflector elements with a layer of silver or with the solution that a white synthetic material plate is arranged at a distance from the retroreflector elements, the retroreflector surface faces the retroreflector elements 12, or the plate 11. First of all, a fundamental difference results out of this.

The chromium or nickel layer 13 is covered with a clear transparent or strongly translucent, advantageously colored layer 14 of synthetic material, whereby the application

Claims

1. Reflector of synthetic material, which has retroreflector elements (triples or the like) formed with optical accuracy, which are covered with a metal layer serving as reflective layer, characterized in that the retroreflector elements (12) formed with optical accuracy are covered with a chromium or nickel layer (13) and this chromium or nickel layer (13) is covered by a transparent layer (14) of synthetic material adhering tightly.
2. Reflector according to claim 1, characterized in that an acrylonitrile-butadiene-styrene based [synthetic material] is used as synthetic material plate (11) for the retroreflector elements (12) to be covered with chromium or nickel.
3. Reflector according to claim 1 and 2, characterized in that on their surface facing the chromium or nickel layer (13), the retroreflector elements (12) have incorporations or adsorptions¹ of copper and the chromium or nickel layer is applied onto this copper layer.
4. Reflector according to the claims 1 to 3, characterized in that the synthetic material layer (14), especially of a casting resin, covering the chromium or nickel layer (13) is smooth on the outside.
5. Reflector according to the claims 1 to 4, characterized in that it consists of a part which is cut out from a large reflector plate.
6. Reflector according to the claims 1 to 5, characterized in that, built as [an] emergency reflective triangle, it consists of three strips which are collapsibly connected at their ends.
7. Reflector according to the claims 1 to 4, characterized in that the synthetic material plate (11) with the retroreflector elements (12) consists of a blown body.

¹ or coatings

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Fig. 1

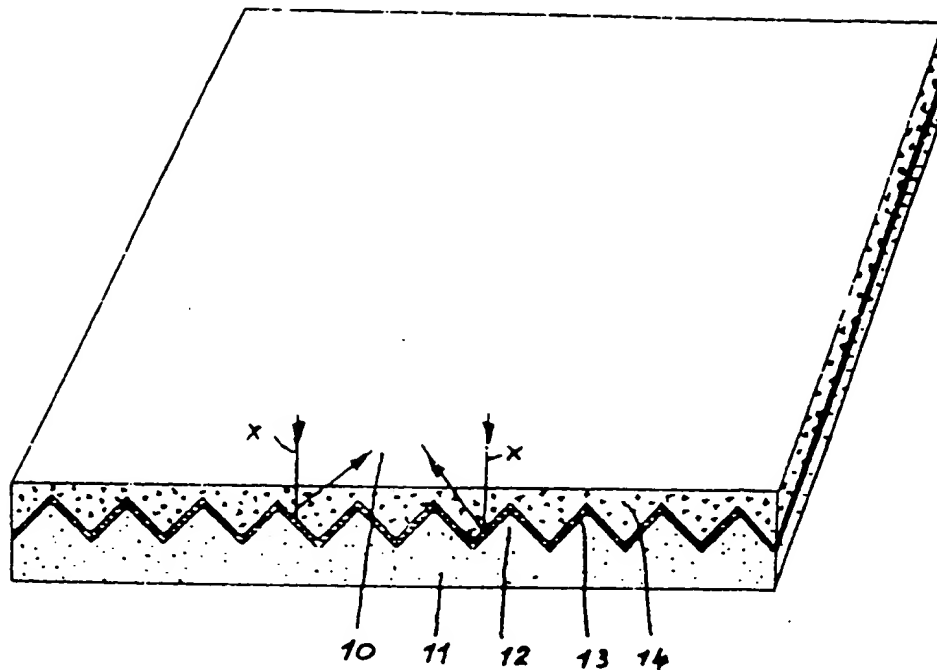


Fig. 2

